**Irradiation cross-linking of ethylene vinyl acetate/waste tire dust: effect of multifunctional acrylates**


ABSTRACT

In an attempt to maximize the beneficial effect of irradiation, the influence of multifunctional acrylates (MFAs) such as trimethylol propane triacrylate, ethylene glycol dimethacrylate, trimethylol propane trimethacrylate, and tripropylene glycol diacrylate on the 90/10 ethylene vinyl acetate/waste tire dust (EVA/WTD) were studied. The 90/10 EVA/WTD and EVA-containing 4 phr MFA prepared using a Haake mixer at 140°C and 50 r minī 1 rotor speed. The blends were then irradiated using a 3.0-MeV electron beam machine. Results on gel fraction revealed that EVA/WTD blends were cross-linked by electron beam irradiation. Among the MFA employed in this studies, TPGDA was found to render highest tensile strength with the best retention in elongation at break and increased heat of fusion and crystallinity of blends upon irradiation. The changes in the properties of EVA/WTD blends upon irradiation are attributed to the cross-linking of the EVA matrix. The changes in crystallinity and crystalline melting temperatures of EVA/WTD blends upon irradiation are discussed in detail.



**Keyword:** Cross-linking; Crystallinity; Ethylene vinyl acetate (EVA); Irradiation; Multifunctional acrylates (MFA); Waste tire dust (WTD)